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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Juei-Hua Lin

Application No.: 10/091,710 Art Unit: 1775

Filed: March 5, 2002 Examiner: Andrew T. PIZIALI

For: **ANTI-REFLECTIVE GLASS SURFACE WITH IMPROVED CLEANABILITY**

DECLARATION BY INVENTOR JUEI-HUA LIN UNDER 37 C.F.R. 1.132

MS Non-Fee Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I, Juei-Hua Lin hereby declare:

1. I am a citizen of the United States and I am over 21 years of age.

2. I am the named inventor of the above-captioned patent application and submit this declaration in support of the patentability of pending claims 1-3 and 31.

3. I tested both the prior art glass and an alkali or alkali earth metal silicate glass comprised of a plurality of islands extending across said surface of said glass at a density of about 60 to about 10,000 islands per square millimeter and each island being between about 10

to about 200 micrometers in diameter and said islands extending across said entire surface of said glass in such a distribution that said islands contribute to providing decreased reflectance of incident light across said surface of said glass; a skeletized silica structure having openings and extending uniformly over the surface of the glass, including the islands, said skeletized structure is about 100 to about 400 angstroms in diameter said openings are about 100 to about 200 angstroms in diameter and uniformly distributed throughout the surface of the glass, wherein the density of said skeletized structure is about 50 to about 70 skeletized structures per 200 nanometers square of said surface; and the product having low reflectance of incident light. I measured the cleanability of the glass and the strength of the active ingredient required to clean both pieces of glass. I submit the results of the tests in Table 1, attached hereto as Exhibit A.

4. It is my opinion that the density of the skeletized structure yielded unexpected results in the form of a glass product that keeps grease at the surface, allowing a mild glass cleaner to remove the grease from the glass surface. As compared to the prior art glass, the structure of the above glass requires a cleaner with $1/20^{th}$ the potency to clean the same grease mark from the surface of the glass.

5. The cited prior art has a skeletized structure that is half the density of the skeletized structure of the claimed glass product. The cleanability of the glass over the prior art, as shown in Table 1, was unexpected and surprising.

6. The cited prior art is only formed from etching glass in a range from -6 potency to -7 ¼ potency. Glass etched within this range possess anti-reflective properties but require approximately 60% isopropyl alcohol to clean grease marks from the prior art glass. Glass etched with potencies between -7 ¼ and -8 ⅛ possess reduced anti-reflective properties. Glass etched with potencies greater than -8 ⅛ has no anti-reflective properties. Although glass cleanability tends to improve with higher potency etching solution, higher potency etching solutions produce reduced to no anti-reflective properties in the glass. Glass etched with potencies between -7 ¼ and -8 ⅛ were not considered commercially viable because of the reduced anti-reflective qualities and the poor cleanability. The "last" -⅛ of the range was not investigated previously because it was thought to be not commercially viable. I discovered that glass etched between -8 and -8 ⅛ potencies still possess reduced anti-reflective properties as compared to the prior art but exhibit a high degree of cleanability. The glass formed with the elements of the claims of the present invention has commercial value because it has anti-reflective qualities and can be cleaned with a common commercial cleaner (e.g. Windex™). The potency ranges above are based on certain soda-lime glass at 15% hydrofluosilicic acid concentration and 44°C. I submit the results in Figure 1, attached hereto as Exhibit B.

7. The determination that etched between -8 and -8 ⅛ potencies will have anti-reflective properties and high cleanability over the prior art, was unexpected and surprising.

8. I further declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true. I further declare that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United States code, and that such willful false statements may jeopardize the validity of the instant application or of any patent issued thereupon.

Dated: September 9, 2004 By Juei-Hua Lin
Juei-Hua Lin

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TABLE 1

CLEANABILITY OF A GREASE MARK* ON GLASS		
CLEANER	PRIOR ART GLASS	PRESENT INVENTION
3% Isopropyl Alcohol	Heavy Mark left on glass	Cleans grease off glass
30% Isopropyl Alcohol	Heavy Mark left on glass	Cleans grease off glass
60% Isopropyl Alcohol	Cleans grease off glass	Cleans grease off glass

* Grease mark formed by rubbing butter on the glass surface.

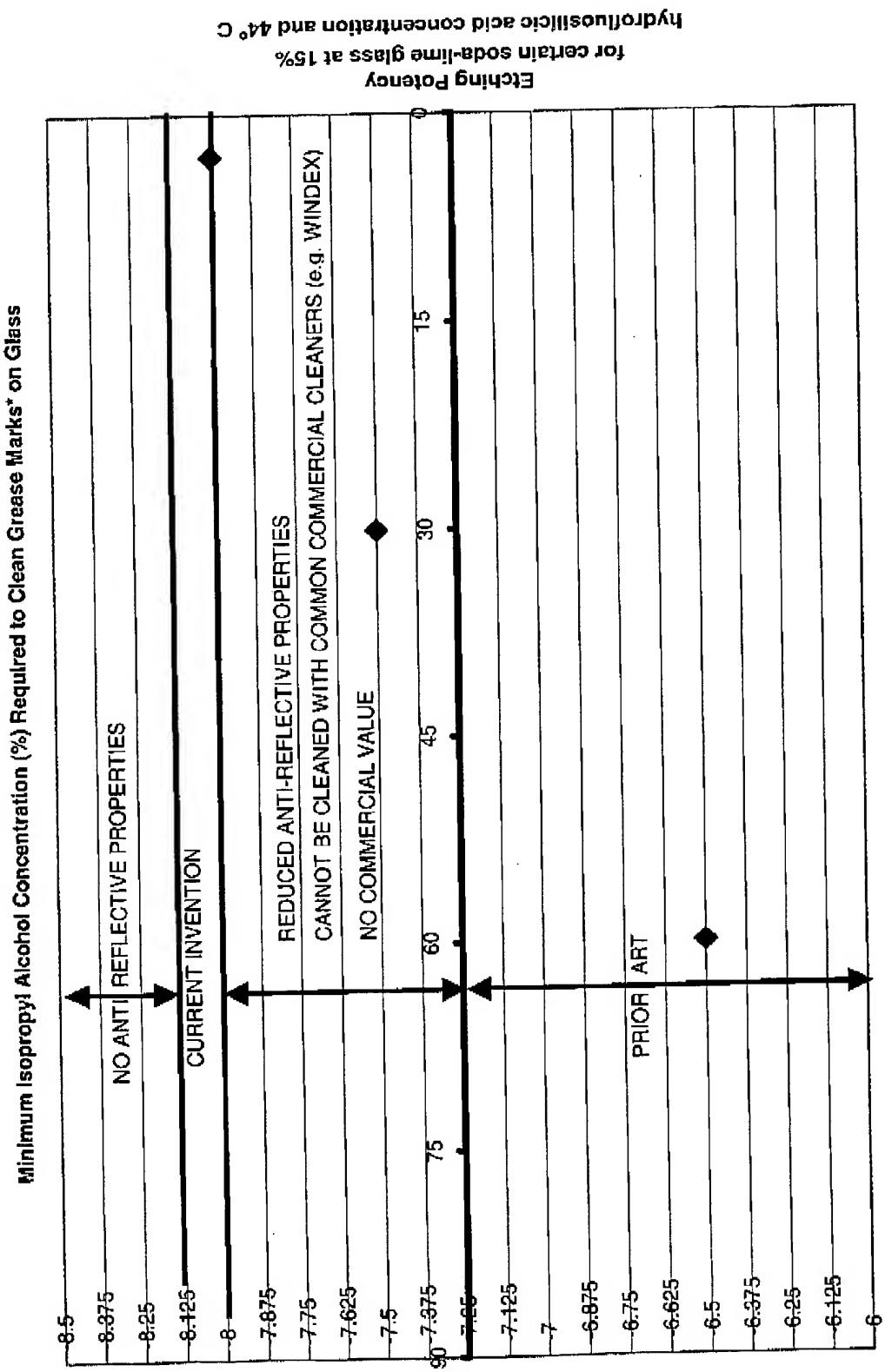
Etching Potency
for certain soda-lime glass at 15%
hydrofluosilicic acid concentration and 44° C
Minimum Isopropyl Alcohol Concentration (%) Required to Clean Grease Marks* on Glass
NO ANTI REFLECTIVE PROPERTIES
CURRENT INVENTION
REDUCED ANTI-REFLECTIVE PROPERTIES
CANNOT BE CLEANED WITH COMMON COMMERCIAL CLEANERS (e.g. WINDEX)
NO COMMERCIAL VALUE
PRIOR ART
8.5
8.375
8.25
8.125
8
7.875
7.75
7.625
7.5
7.375
7.25
7.125
7
6.875
6.75
6.625
6.5
6.375
6.25
6.125
6
0
15
30
45
60
75
90

FIGURE 1